



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,669	12/18/2000	Ranjit J. Rozario	388682000400	3488

20872 7590 10/02/2003
MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA 94105-2482

EXAMINER

SCHNEIDER, JOSHUA D

ART UNIT	PAPER NUMBER
----------	--------------

2182

DATE MAILED: 10/02/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,669

Applicant(s)

ROZARIO ET AL.

Examiner

Joshua D Schneider

Art Unit

2182

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,9-14 and 19-24 is/are rejected.
- 7) ☒ Claim(s) 6-8 and 15-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

Response to Arguments

1. Applicant's arguments filed 8/11/2003 have been fully considered but they are not persuasive. Each of the arguments is responded to below, with reasoning for non-persuasiveness with regards to the respective claims.
2. With regards to claim 5 and 14, the term "in-flight" is not established in the art, and the section of the specification cited by the Applicant does not enable one of ordinary skill in the art to practice or understand the invention. While the specification does provide some basis for understanding what the term may mean (page 14, lines 6-7), it does not make clear how this term is applied in the invention. It remains unclear how a packet can be both being processed and waiting to be scheduled for DMA transfer, so that it would be usable with the invention. It would instead seem that as set forth by the specification, the field would indicate that the data transfer is already in progress, and therefore is not in need of being scheduled.
3. With regards to claim 9, the use of a FIFO requires that the first data sent into the data structure be the first data out of the data structure, hence the first-in, first-out name. The name is part of the definition cited by the Applicant. The Applicants argument that what is written in is eventually read out is not persuasive, as a first-in, first-out buffer would not allow first-in, eventually-out ordering, and therefore shifting could not occur. This is also clearly set forth in the second definition of the Applicants reference. For further clarification of the definition of FIFO, please see the definitions from whatis.com, and the Microsoft® Computer Dictionary, fifth edition, below.

Art Unit: 2182

whatis.com:

Also see named pipe (sometimes referred to as a "FIFO").

In computer programming, FIFO (first-in, first-out) is an approach to handling program work requests from queues or stacks so that the oldest request is handled next. LIFO (last-in, first-out) is an approach in which the most recent request is handled next and the oldest request doesn't get handled until it is the only remaining request on the queue (or in the stack). Although LIFO seems "unfair," it may be more efficient. A stack that is handled using LIFO is sometimes referred to as a *push-down* or *push-down pop-up* stack or list.

Microsoft® Computer Dictionary, fifth edition:

A method of processing in a queue, in which items are removed in the same order in which they are added – the first in is the first out. Such an order is typical of a list of documents waiting to be printed. *Acronym*: FIFO.

4. With regards to claims 1, 10, and 19, the applicant is reminded that the invention need not be expressly suggested by the references. In response to applicant's argument that neither of the references discloses "wherein each entry includes a weight that is determined based on a plurality of fields" as recited in claim 1, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case Bass teaches a plurality of fields used in the arbitration of packets in a DMA scheduler. Lee teaches the sorting of elements in a shifting system in which an element is placed ahead of other elements with lower values, and behind elements with greater values. These references suggest that the attempt to sort out elements by priority could be accomplished by a shifting structure as taught by Lee.

Art Unit: 2182

5. Bass teaches that arbitration can be accomplished in a straight priority fashion (column 5, line 60, through column 6, line 2). Such priority schemes give precedence to elements deserving prior service based on importance, rank, or superiority, as established in Bass by the fields of the TSPT table. The sorting shift structure, as taught by Lee, is used to order these elements in accordance to there relative importance, or weight. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the DMA scheduler of Bass with the shift structure of Lee, in order to increase the speed of arbitration by increasing sorting efficiency.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 5 and 14, and claims 6-8 and 15-18 dependent from 5-14, are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The term “in-flight” is not established in the art, does not enable one of ordinary skill in the art to practice or understand the invention. An artisan would be unable to assign the “in-flight” field without further detail as to its definition.

8. All further rejections and objections are made in light of the specification as best understood by the examiner in view of the previous rejections and objections.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claim 9 is rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. The shifting structure as taught by the invention could not be embodied as a FIFO device. A FIFO device by definition is processed in a very linear fashion. The first object added is the first object removed, not allowing for shifting, or sorting.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-4, 10-13, and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,504,919 to Lee et al. in further view of U.S. Patent 6,052,375 to Bass et al. With regards to claim 1, Lee teaches a shift structure having a plurality of entries, and a comparison logic circuit to sort the entries based on their respective weights (see abstract and Fig. 2). Lee does not teach the plurality of entries having a plurality of fields, or the entries being DMA channels. Bass teaches a scheduler for DMA channels data transfer. Bass teaches a plurality of fields in a parameter table (column 4, line 46, through column 5, line 38). Bass further teaches that queues are sorted for output to a traffic queue allocation manager (column 5, lines 42-44). Bass further teaches the DMA bus arbitration based on a straight priority fashion

Art Unit: 2182

(column 5, lines 60-64). While Bass does not use the term weights, it is would have been obvious to one of ordinary skill in the art at the time of invention, that the terms weight and priority are interchangeable in this context. Both words, as used in this application, indicate an importance or superiority in relation to competing entities. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the DMA scheduler with the shift structure of Lee, in order to increase the speed of arbitration by increasing sorting efficiency.

13. With regards to claims 10 and 19, Lee teaches the writing of a plurality of entries into a shift structure, and a comparison logic circuit to sort the entries based on their respective assigned weights (see abstract and Fig. 2). Lee does not teach the plurality of entries having a plurality of fields, or the entries being DMA channels. Bass teaches a scheduler for DMA channels data transfer. Bass teaches a plurality of fields in a parameter table (column 4, line 46, through column 5, line 38). Bass further teaches that queues are sorted for output (column 5, lines 42-44). Bass further teaches the DMA bus arbitration selection based on a straight priority fashion (column 5, lines 60-64). It is inherent in Bass that the highest priority entry is read out for service (column 5, line 65, through column 6, line 2). With further regards to claim 19, it is inherent in Bass that all channels would be resorted after service as long as there is pending data. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the DMA scheduler with the shift structure of Lee, in order to increase the speed of arbitration by increasing sorting efficiency.

14. With regards to claim 11, it is inherent in Bass that all channels would be resorted after service as long as there is pending data.

Art Unit: 2182

15. With regards to claim 2, Lee teaches the comparison of the entry, or item, for insertion with the sorted entries in the shift structure (column 3, lines 5-8).

16. With regards to claims 3, 12, and 20, Lee teaches the entry being inserted, or written, behind the sorted entries with higher weights and shifting of entries in the shift structure with lower weights (Fig. 1b, and column 3, lines 13-18).

17. With regards to claims 4, 13, and 21, Lee teaches the entries having a plurality of fields (Fig. 2), and Bass teaches the entries being made of a plurality fields each assigned to a set of bits (column 4, line 46, through column 5, line 38).

18. With regards to claim 22, Bass teaches a priority field (column 5, lines 25-38), and it would have been obvious to one of ordinary skill in the art that a priority field would have a plurality of priority levels, as any binary field would have at least two levels.

19. With regards to claims 23 and 24, SONET is an interface standard that is well known, and OC numbers are well known in the art. It would have been obvious to one of ordinary skill in the art that a priority field could be set according to OC numbers as bandwidth prioritizing is well known in the art.

Conclusion

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Art Unit: 2182


will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua D Schneider whose telephone number is (703) 305-7991. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on (703) 308-3301. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

JDS


JEFFREY GAFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100